

A paper was read, entitled, "On the development and extinction of regular doubly refracting structures in the crystalline lenses of animals after death." By Sir David Brewster, K.H., LL.D., F.R.S.

Since the year 1816, when the author communicated to the Royal Society an account of the doubly refracting structures which exist in the crystalline lenses of fishes and other animals, he has examined a great variety of recent lenses with the view of ascertaining the origin of these structures, the order of their succession in different lenses, and the purpose which they answer in the animal economy. He had discovered in the lenses of many fishes the alternation of portions, exerting, the one a positive, and the other a negative refractive action ; but in his subsequent investigations he met with the greatest discrepancy as to the regularity of their arrangement. He found that in quadrupeds the central structure is positive ; while in fishes, where there are three structures, it is always negative ; but their positive structure in the former case sometimes exists alone, with faint traces of a negative structure, and sometimes it is followed by another positive structure separated from the first by a black neutral circle, in which the double refraction disappears ; at other times various other combinations of these structures are presented. Occasionally, in the dark neutral line, which separated two positive structures, he perceived a trace of an intervening structure, which seemed to be either about to disappear or about to be developed. This conjecture was satisfactorily verified by a series of observations which he made on the lenses of the sheep, the ox, and the horse, at different ages, and also on the same lens, during the spontaneous changes it undergoes when kept in distilled water. The negative structure was in these experiments gradually developed at the space intervening between the portions of the lens which had possessed the positive structure ; and thus the same parts assumed in succession doubly refractive actions of opposite kinds. The author intimates his intention of pointing out, in a separate paper, the conclusions deducible from these facts respecting the cause and cure of cataract.

June 8, 1837.

WILLIAM LAWRENCE, Esq., V.P., in the Chair.

Robert Bigsby, Esq., George Edward Frere, Esq., and Captain Joseph Ellison Portlock, R.E., were elected Fellows of the Society.

A paper was in part read, entitled "Observations on the minute structure of the higher forms of Polypi, with observations on their classification." By Arthur Farre, M.B. Communicated by Richard Owen, Esq., F.R.S.

June 15, 1837.

FRANCIS BAILY, Esq., V.P. and Treasurer, in the Chair.

James F. W. Johnston, Esq., A.M., was elected a Fellow of the Society.

The following papers were then read, viz. :

"Observations on the minute structure of some of the higher forms of Polyypi, with views of a more natural arrangement of the class." By Arthur Farre, M.B., Lecturer on Comparative Anatomy at St. Bartholomew's Hospital. Communicated by Richard Owen, Esq., F.R.S., was resumed and concluded.

After a short account of the labours of preceding naturalists in that department of zoology which comprises the various kinds of polypes, and of the different characters on which they have founded the classification of these animals, the author proceeds to the statement of his own observations on several species which had not been previously investigated with sufficient minuteness and care. Two of the species described he believes to be entirely new, and he has accordingly given them the names of *Bowerbankia densa*, and *Lagenella repens*. The other species which are the subject of the author's investigation, are *Vesicularia spinosa*, *Valkeria cuscuta*, *Alcyonidium diaphanum*, *Membranipora pilosa*, and *Notania loriculata*.

He then discusses the principles on which the classification of this tribe of zoophytes should be founded, and proposes on these principles to give the name of *Ciliobrachiata* to the whole group of polypes characterised by the possession of ciliated tentacula, and a free alimentary canal with two orifices: this group again he divides into two subordinate groups, namely, the *Hydriform* and the *Actiniform*, or *Zoanthiform* polypes. Under the title of *Nudibrachiata* he proposes to comprehend all those polypes which partake of the nature of the hydra, and whose tentacula are unprovided with cilia, corresponding to the *Anthozoa* of Ehrenberg.

"On the Temperature of Insects, and its connexion with the functions of Respiration and Circulation." By George Newport, Esq. Communicated by P. M. Roget, M.D., F.R.S.

The author states at the commencement of his paper, that, although it has been long known that insects living in society, as the bee and the ant, maintain in their habitations a temperature higher than that of the open air, the fact had never yet been established that individual insects of every kind possess a more elevated temperature than that of the medium in which they reside, and that in each species the degree of elevation varies in the different stages of their existence. He was first led to study the temperature of insects in consequence of the curious results which he had met with in some observations he had himself made, in the autumn of the year 1832, on a species of wild bee in its natural haunts, with a view to ascertain, as had been suggested to him by Dr. Marshall Hall, the relation between the temperature of these insects during their hybernation, and the irritability of their muscular fibre: but the fact of the existence of a higher temperature in individual insects had been ascertained by himself prior to these observations; the results of which observations, together with other facts connected with the physiology of insects, he subsequently communicated to Dr. M. Hall.